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ABSTRACT

The third volume in a series of three resource guides, this volume provides an explanation of domains of anticipated assistive technology impact across functional areas of an individual's life. A matrix grid of functional categories affected by assistive technology is provided to serve as a developmental step toward the creation of guidelines for consistent and meaningful data collection in assistive technology outcomes assessment. The matrix represents five functional categories: self care, sitting/mobility, transportation, communication, and setting specific. The five areas in which assistive technology affects the functioning of a person include: work, education, recreation, home/family, and community. Each cell of the matrix grid identifies the primary and secondary sources of funds for each area, which may be medical, vocational, educational, or by consumers. Questions are provided to assess the outcomes of assistive technology in personal care and management, sitting and mobility, transportation, and communication. Case studies are provided to illustrate assistive technology outcomes. (CR)

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VOLUME III:
RESNA RESOURCE GUIDE FOR ASSISTIVE TECHNOLOGY OUTCOMES: DEVELOPING DOMAINS OF NEED AND CRITERIA OF SERVICES

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-- Lucy U. Vitaliti, Ph.D.
Project Director

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VOLUME III:
RESNA RESOURCE GUIDE FOR
ASSISTIVE TECHNOLOGY OUTCOMES:
DEVELOPING DOMAINS OF NEED AND CRITERIA OF SERVICES

INTRODUCTION

This document is the third in the three volume set of the *RESNA Guide for Assistive Technology Outcomes*. The volumes are as follows:

VOLUME I: RESNA RESOURCE GUIDE FOR ASSISTIVE TECHNOLOGY OUTCOMES: MEASUREMENT TOOLS

VOLUME II: RESNA RESOURCE GUIDE FOR ASSISTIVE TECHNOLOGY OUTCOMES: ASSESSMENT INSTRUMENTS, TOOLS, & CHECKLISTS FROM THE FIELD

VOLUME III: RESNA RESOURCE GUIDE FOR ASSISTIVE TECHNOLOGY OUTCOMES: DEVELOPING DOMAINS OF NEED AND CRITERIA OF SERVICES

Volume III, RESNA Resource Guide for Assistive Technology Outcomes: Developing Domains of Need and Criteria of Services is the culminating product of several workgroups and countless hours of consensus by conference call and mailings to identify assistive technology needs areas by functional categories and by primary payers for that technology. The volunteer members of these workgroups included Frank DeRuyter, Marcia Scherer, Barbara Ketcham, Jean Minkel, Barbara Sweet, Ellowene Clifford, Sue Mistrett, Roger Smith, Gerry Warren, Alexandra Enders and RESNA staff Lucy Vitaliti and Nashiydah Anderson.

The **Matrix Grid of Functional Categories Effected by Assistive Technology** evolved from those workgroup discussions. The Matrix represents five functional categories in five applied areas of life affected by assistive technology. Affect is the cause of the effect on something else. In this application, assistive technology (the affect) has an effect on people's lives. The effects are more easily identified and defined when looked at from functional categories of everyday living. Certainly, there are many areas of life potentially affected by assistive technology (AT), but 5 were chosen so as to be able to be broad enough

in scope yet defined enough so adequate attention could be given them in the confines of an interdisciplinary document such as this. (See Figure 1.) The five functional categories of focus in the matrix are Self Care, Sitting/Mobility, Transportation, Communication, and Setting Specific. The five areas where assistive technology is applied to affects the functioning of a person in those areas includes: Work, Education, Recreation, Home/Family, and Community. The grid identifies in each cell of the grid the funders of primary and secondary focus which may be one or more of the following: Medical, Vocational, Education, or Consumer. The Matrix Grid provided the basis for the development of this document through the formation of questions directed to each functional category. It helps the payor, service provider, and consumer identify the most appropriate domains of need so that they can be better equipped to fulfill the criteria for services.

Matrix Grid of Functional Categories
Effected by Assistive Technology

Payers are defined as follows:

- Medical may include insurance companies, Medicaid, Medicare, private insurers, workers' compensation.
- Vocational payers may include state or federal vocational programs, postsecondary education programs or institutions.
- Education as a payer may include: general or regular education programs, special education programs, transition programs, vocational rehabilitation in postsecondary education or training programs.
- Consumer as payer includes the consumer as end user, family members, or primary or secondary caregivers to the person with a disability, or other means that directly assist consumers in purchasing AT.

The payers are identified in each grid by the first letter of the type/name of payer, i.e., M, m, for Medical; V, v, for Vocational; E, e, for Education, and C, c for Consumer. A capitalized letter denotes that payer as the primary payer of assistive technology in that particular applied area. A small letter denotes secondary funder, e.g., M = Medical - Primary funder; v = vocational secondary funder; e = educational secondary funder.

This document, the **RESNA Resource Guide for Assistive Technology Outcomes: Developing Domains of Need and Criteria of Services** provides a sketch of the scope of

each cell in the matrix and the possible measures of the effect of assistive technology on the functional categories in each of the applied areas by posing questions specific to that area. These are questions that the service provider, practitioner, payor, or consumer might ask to elucidate expectations of themselves, the technology, the service provider, as well as help identify goals and objectives to meet those expectations. In the case of 3rd party payers, these may also be questions that may have to be answered by providers or consumers to provide justification for payment of the service or equipment. For many of the cells, a case or "life study" may have been included for the reader to apply the questions presented.

In certain cells of the matrix, Consumer may be the only payer identified by consensus of the workgroup. Subsequently, these cells when expounded upon in the question section may not be as fully expressed as those areas where there are 3rd party payers.

The overarching goal of this document is to assist the non-consumer payers in identifying measurable goals and anticipated outcomes of assistive technology, and subsequently, better understand the value of the assistive technology intervention. It is hoped that this document will also facilitate goal setting for use of assistive technology by consumers and practitioners.

Further Use Of The Matrix Grid Of Functional Categories Effected By Assistive Technology

The primary purpose of the MATRIX GRID OF FUNCTIONAL CATEGORIES EFFECTED BY ASSISTED TECHNOLOGY (Grid) is to serve as a development step toward the creation of guidelines (or potentially a flexible set of instruments) for consistent and meaningful data collection in assistive technology outcomes assessment. This means that the longer term usefulness of the grid is yet to be manifested.

While the shorter term application of the grid is somewhat abstract, it does also promise some benefit at even this stage of its development. Practitioners are encouraged to review the grid to see where their area of practice fits. This should highlight the breadth and depth of assistive technology devices, how we tend to fragment our services, and encourage better linking among providers for more comprehensive services.

In a more case by case use of the Grid, the tool might be considered a screening instrument. This is how it was envisioned to be applied in discussions among the workgroups. For example:

a) As an individual is referred to the assistive technology service provider, the Grid should be described to the potential user of assistive technology. Together, the cells in the Grid should be explored to see which Applied Areas and Functional Areas indicate that there may be a need for services (hence, a step toward defining criteria for services). These should be interpreted as areas needing further assessment which might be provided by the current service program the current services or referral made to another program where more competent assessments might be performed.

b) When further assessment is determined to be needed the Grid provides the framework with which ongoing evaluation and reassessment can be viewed in context.

c) The accompanying descriptions of each cell show what types of behaviors which might be scrutinized and measured to determine status and progress within each cell of interest.

d) It is planned that future research and development efforts will better examine these cell contents for completing a more refined view of outcomes in assistive technology.

e) Based on the content of the cells in this matrix, guidance can be provided toward the use of specific instruments or assist in formulating more effective methods for measuring the assistive technology outcomes.

Figure 1

Assistive Technology Functional Category Matrix

Applied

Functional (Areas we want to measure.)		A Work		B Education		C Recreation		D Home/Family		E Community	
1	Self-Care	m		**M**	e	m		**M**			
	(Personal Care & Management)	**V**	c	**V**	c		**C**	v	c		**C**
2	Sitting/ Mobility	**M**		**M**	e			**M**		**M**	
	(Positioning & Mobility)	v	c	v	c		**C**	v	c		c
3	Transportation				**E**			m		m	
		V	**C**	**V**	c		**C**	v	**C**		**C**
4	Communication				**E**			**M**	e	m	
		V	c	**V**	c		**C**	v	c		**C**
5	Setting Specific				**E**			**M**			
		V	c	**V**	c		**C**	**V**	**C**		**C**

M = Medical
V = Vocational
E= Educational
C = Consumer

Bold = Primary funder
No bold = secondary funder

CAPITAL LETTER = PRIMARY PAYOR
Small Letter = secondary payor

Matrix created by Roger O. Smith

A1 / PERSONAL CARE & MANAGEMENT for WORK

PAYERS: **Vocational - primary payer**
Consumer - primary payer
Medical - secondary payer

Technology itself

- How much does the percent of day AT is actually used match the percent of the day it is recommended to be used?
(Goal: 100% compliance)

- How pleasant is the technology to look and how well does it not eclipse the user?

- How can the technology can be customized to accommodate developmental changes, adaptable for growth and change over time?

- What is the level of involvement of families, coworkers, and community? Very involved, involved, aware, unaware?

Social Interaction

- What is the individual's desire to interact with peers?

- What is the individual's ability to interact with peers?

- Are there ways to increase social opportunities?

- How can technology assist in social interactions?

Endurance

- How can the technology or other intervention increase comfort, decrease pain (medical well-being) so person can better attend to work activities and perform tasks?

- How can exposure to pressure areas be creased thereby saving skin integrity?

- How can the technology or other intervention enable user to sit throughout day (or whatever time period identified as goal)?

- Can time be decreased to complete a task?

Access & Movement

- What is the morning routine - medications, health maintenance?

- What is the evening routine?

- What are toileting, grooming, changing clothing needs to complete work (e.g., lab coats)? and how are they to be met?

- What are the preferred routines for eating lunch or snacks at work?
- What are departure from work needs?
- Is this individual responsible for care of others?
- How can user move independently or with chosen amount of assistance?
- How can the technology make the individual more independent and use less aid care?
- What is the access to any special areas necessary for performing self care?

Life Study: Gordon
A1 Self Care at Work

Gordon, 41 years of age, C4 quadriplegia, wanted to be able to perform leg bag drainage without assistance. The AT desired was an electric switch and valve. An ad was taken from a magazine and given to VR counselor. The need for it and purchase arrangements were discussed with VR Counselor who then purchased the AT. Client had the switch and valve installed by a home-health aid.

Outcome: Gordon is satisfied and can perform drainage without any assistance.
-- Marty Blair

Life Study: Gerry
A5, D5 Setting Specific: Work, Home

Fifty-six year old, Gerry, has multiple sclerosis. She has functional use of only one index finger and her ROM is limited to proximal control. The goal is for her to establish independence in the use of environmental controls and computer access for word processing and a special crossword puzzle program. The system should allow Gerry to access controls using a single finger and voice input.

Gerry was initially evaluated with a wireless remote mouse and a PRC "Headmasher". She was unable to control either. An evaluation using Dragon Dictate and "SAM" yielded positive results.

The system was installed and two days of on-site training using Dragon Dictate and "SAM" were provided. Gerry is now able to develop her crossword designs and sell them to national publications.

These services were paid for by Vocational Rehabilitation (NYS VESIP).
-- Jurgen Babirad

Life Study: Ronald
A5 Setting Specific: Work

Ronald had been unemployed for several years and applied for services through DVR. During the application process, Ronald was interviewed for a job with a not-for-profit agency. He could be hired if he could have the adaptive equipment he needed. The functional goal for Ronald was to have a computer and other equipment accessible. The desired AT consisted of a computer, Tash mini keyboard with frequency of use key arrangement, track ball, voice activated input, speaker phone, X-10 control of lights, fan, and radio. The AT procured consisted of a 486 computer, Kensington track ball, Tash Keyboard, Dragon Dictate, X-10 controls, and speaker phone. DVR and the employer were the payers. DVR provided the computer and adaptations. The employer provided the accessible work space, speaker phone and environmental controls.
-- Mary Secora

Life Study: Connie
A5 Setting Specific: Work

Connie needed to be able to access her computer, printer, phone and other office essentials. Originally a computer and software to do typesetting was desired, along with a printer, and software, speaker phone, track ball, electric stapler, CD Rom. The AT procured was a 486 computer, scanner, printer, CorelDraw and Ventura publishing software, Kensington Track ball, electric stapler, speaker phone, halogen light, later Pentium computer with more RAM and speed, CD Rom and software upgrade.

Connie works part time for a not-for-profit organization. She applied for services from DVR and received the 486 computer, software, etc. As she became more creative, her tasks increased and her equipment was not fast enough. She reapplied to DVR for the upgrades and the request was denied. DVR felt the employer should cover the costs. Employer felt it was a hardship as Connie was a part time employee. Connie appealed to DVR and was granted a hearing. At the hearing, Mary Secora (author of this case study) testified why Connie needed the upgraded equipment. In addition to limited mobility from Cerebral Palsy, Connie has Myasthenia Gravis, which caused extreme fatigue in muscles, making it impossible for her to work on a full time basis. Her equipment performed so slowly that much of her time was just spent "waiting" for proof copies to print out, etc. In addition, the reach to the paper feeder and final copy area on the printer was difficult to access. The CD Rom was requested so that graphics would not hog the available memory on the hard drive. Connie won her appeal. An evaluation indicated that her present computer was outdated and unable to handle the upgrades needed. Connie eventually received the new Pentium computer with the CD Rom and the new software. She was denied a new printer but did receive the upgrade to old printer memory.
-- Mary Secora

Life Study: James
A5 Setting Specific: Work

James, 20 years old, CP spastic quadriplegia had a goal to be able to deliver mail to faculty at university setting. The AT desired was an adaptor for wheelchair tray to hold or a carrying case for use in mail delivery. A grant was the payer of the AT.
Ideas for "jobs" were gathered from James and technological assistance was sought.Solutions for mail delivery were brainstormed by the consultant and his school PT. IT was decided that a commercially available soft sided briefcase would be used with an accordion style file folder. The procedure for mail delivery was altered through efforts by James and his work/study coordinator. They composed and sent out letters to faculty describing his job and hours/days he would be available to deliver mail. A large map of the faculty offices with delivery codes of those faculty who agreed to delivery was laminated and placed on his lap tray. The delivery bag hung from his lap tray. With the assistance of a job coach, James was able to determine whose mail needed to be removed from the faculty mailboxes and placed in his mailbag. He then drove to the correct faculty office and delivered mail. The mail bag hung in front of him, across his legs so that he would maintain eye contact with the faculty. James was successful in this job which provided him with entry level work behaviors. He was proud of his ability to work in a university setting.
-- Denise Brown-Triolo

Life Study: Sarah
A5 Setting Specific: Work at Home

Sarah, 40 years of age wanted to be able to operate quilting machine without causing further problems with current Carpal Tunnel Syndrome. Custom modifications to the quilting machine were needed including ratchet system to operate rollers, rail upgrade, and handle modification for proper ergonomic positioning. Bureau of Vocational Rehabilitation was the payer. An initial evaluation with client and case worker was held to identify problems experienced with current equipment and to identify current equipment characteristics. Research was conducted on the available equipment and found the design interventions for modification necessary were not commercially available. Meeting held with client and

caseworker to discuss options and client make decision on required modifications. Fabrication of custom items, and purchase of upgrade rails. Items were installed and follow up occurred with client to insure all was working properly. The outcome of this AT intervention is that Sarah is now able to operate the quilter 8 hours a day without pain.
-- Carole Weber

Life Study: K.W.
A5 Setting Specific for Work

K.W. is in her forties. She teaches music, writes children's stories and is visually impaired. She wishes to pursue a writing career to provide a secondary income and have access to a computer and the Internet.

After much begging and pleading, an IWRP and the approval of vocational rehabilitation, she received a reading/music stand from Services for the Blind, visual aids from VR, a screen reader from the Assistive Technology Loan Library and a computer w/software programs through the Western Kansas Access Site.

K.W. now has access to the Internet and Bulletin Board Services. She uses her assistive technology to successfully maintain her teaching job and continue to write children's books from her home.
-- Robert Dey

B1 / PERSONAL CARE & MANAGEMENT for EDUCATION

PAYERS: **Medical - primary payer**
Education - secondary payer
Vocational - primary payer
Consumer - primary/secondary

Technology itself

- How much does the percent of day the AT being used match the percent of the day it is recommended to be used? (goal: 100% compliance)

- How pleasant is the technology to look at and does not eclipse the user?

- How much can the technology can be customized to accommodate developmental changes, adaptable for growth and change? Is it feasible or cost effective?

- How involved are families, coworkers, and community?

Social Interaction

- What is the individual's desire to interact with peers?

- What is the individual's ability to interact with peers?

- Are there ways to increase social opportunities?

- How can technology assist in social interactions?

Endurance

- How can the technology or other intervention increase comfort, decrease pain (medical well-being) so person can better attend to attend to schoolwork, school activities?

- How can exposure to pressure areas be creased thereby saving skin integrity?

- How can the technology or other intervention enable user to sit throughout day (or whatever time period identified as goal)?

- Can time be decreased to complete a task?

Daily Access & Movement

- What is the morning routine - medications, health maintenance?

- What is the evening routine?

- What are toileting, grooming, changing clothing to complete work (e.g., lab coats)? and how to be met?

- What are the preferred routines for eating lunch or snacks at school? Parties at school?

- What are departure from school needs?
- How can user move independently or with chosen amount of assistance?
- How can the technology make the individual more independent and use less aid care?
- What is the access to any special areas necessary for performing self care?

Life Study: Chris

B1, D1 Self Care at Education and Home (lives in college dormitory)

Chris is in his mid 20's. His functional goal was to do independent transfers from bed to wheelchair to bed or wheelchair to commode to wheelchair. He has cerebral palsy and spastic quadriplegia. NY Medicaid was the payer for the AT desired and procured: a Permobil motorized wheelchair with power seat elevator, tilt, and recline. Heavy duty seat covers and puller bars and straps allow Chris to climb in and out of the chair.

Chris was evaluated in office. Life interview done and goals enumerated. Several wheelchairs with various features were tried to allow goal attainment. Selected Permobil. Took photos to support justification. Chair specifications were sent to varied manufacturers to determine ability to supply custom items needed and provide quote. Justification information and evaluation report sent to physician for preview and approval along with Medicaid form for signature. Report and form sent back to Dynamic for pricing and submission to Medicaid for prior approval. Questions received at Dynamic; answers and forms resubmitted. Approval obtained and Chris returns to office for shape sensing process for creation of seating system ordered. Seating system arrives and is fitted. Wheelchair arrives and Chris meets with manufacturer of custom components to measure for these components. Wheelchair and seating system assembled and modified. Wheelchair returned to Dynamic. Wheelchair delivered to consumer for two week trial use before finalization.

-- Adrienne Bergen, PT, ATP, ATS, CRTS

Life Study: Karin

B1 Self Care at Education

Karin, age 15 has myleomeningocele and wants to increase her ability to perform transfers, carrying books, and increase self catheter ability. The AT desired was a lightweight wheelchair at appropriate seat height with an underseat net for books. Net needed to be lightweight, large capacity and accessible. A custom cushion was needed to correct pelvic obliquity and to allow ease of catheterize. The AT procured was an Etac Act wheelchair, Sammons underseat net, and Pin Dot silhouette cushion. Insurance was the primary payer.

Client flew to Chicago from Connecticut bringing existing equipment. Client generated list of problems with fit of existing equipment. PT performed mat evaluation (ROM of extremities and spine, pelvic mobility, postural evaluation, balance evaluation and some information by PT report, i.e., car transfers , layout of school. Considered seating needs first, especially need to eliminate pelvic obliquity and increase lumbar extension. Tried building up under Jay active flo lite pad, and considered custom foam (cut Silhouette). Decided on Silhouette for factors: lightweight, coated foam, available trial period, and had good postural results on MSS. Client's need and desire to lighten weight of present chair led to desire to try Etac Act. Discussed options for books and viewed catalogs for briefcase holders, book bags, tray, underseat net, Client chose latter. Client returned home. Act wheelchair was obtained for trial from manufacturer. Silhouette was received. Client returned to Rehab Institute to evaluate cushion in wheelchair, propulsion transfers, including vehicular, and appearance. Client preferred to own wheelchair, and specifics were defined, including size, STF, seat tilt, back angle. A vendor local to Chicago was chosen to facilitate quick fittings, quick delivery (family choice) and a vendor close to home was chosen for repairs. Information submitted to vendor and insurance approval obtained. Note: cushion was post approval. Family paid for book net which was attached to wheelchair when delivered from manufacturer. Need for custom footrests was addressed cleverly by vendor. Client returned for final fitting and adjustments. The outcomes included increased posture and balance of

client. Client appeared satisfied with ultralight weight, appearance, and maneuverability. She could catheter. She found the underseat net preferable to previous bookbag. She found the backrest upholstery not deforming, had easier access, and better wheelchair balance.
-- Judith Russ Habasevich, PT

Life Study: L.F.W.
B1 Self Care in Education

L.F.W. is a 22-year-old woman with cerebral palsy. Her goal was to receive her G.E.D. She borrowed a computer system along with the appropriate software to assist her in obtaining her G.E.D. and developing her computer skills. She passed the equivalency and may be in line for a position as a data processor.
-- D. Powers

C1 / PERSONAL CARE & MANAGEMENT for RECREATION

PAYERS: **Consumer - primary payer**
Medical - secondary payer
Vocational- secondary payer

Outcomes or goals may be similar to the applied areas of Work and Education

Technology itself

- How much does the percent of day AT is actually used match the percent of the day it is recommended to be used?
(Goal: 100% compliance)

- How involved are families, friends, coworkers, and community? Very involved, involved, aware, unaware?

- How pleasant is the technology to look and how well does it not eclipse the user?

- How can the technology can be customized to accommodate developmental changes, adaptable for growth and change over time?

Social Interaction

- What is the individual's desire to interact with peers?

- What is the individual's ability to interact with peers?

- Are there ways to increase social opportunities?

- How can technology assist in social interactions?

Endurance

- How can the technology or other intervention increase comfort, decrease pain (medical well-being) so person can better attend to work activities and perform tasks?

- How can exposure to pressure areas be creased thereby saving skin integrity?

- How can the technology or other intervention enable user to participate throughout activity (or whatever time period identified as goal)?

- Can time be decreased to complete an activity, e.g., bowl full game?

Access & Movement

- What are the routines throughout day that need to be planned for, i.e., medications, health maintenance?

- What are toileting, grooming, changing clothing needs in order to participate (e.g., smocks, protective clothing, scuba gear)? and how are they to be met?

- What are the preferred routines for eating meals or snacks?
- What are transportation needs?
- Is this individual responsible for care of others?
- How can user move independently or with chosen amount of assistance?
- How can the technology make the individual more independent and use less aid care?
- What is the access to any special areas necessary for performing self care?

Life Study: Nedra

C1 Self Care in Recreation and D1 Self Care in Home

C2 D2 E2 Positioning and Mobility in Recreation, Home, Community

Nedra Taylor, a 57 year old woman with osteoarthritis, PMR, CHF, morbid obesity, and has an open surgical wound. She is a homemaker, shopping volunteer, and active in church activities. Vocational rehabilitation was the payer as well as private insurance and the Independent Living Center.

Nedra wanted to be able to attend operas, children's programs, spectator sports, picnics, as well as handle all her home chores and raise her daughters. She wanted to be able to do her own shopping, get to physical therapy and doctor's appointments independently.

The desired technology was a manual wheelchair, cane and crutches, raised toilet seat, and tub bars. Medicaid/Medicare paid for crutches and toilet seat. Nedra purchased a used wheelchair, as well as bath stool and cane from a local pharmacy. Nedra can get up from the toilet with greater ease and can shower independently. She uses the crutches and cane around the house for stability, mobility and short walks. Her endurance time has lengthened.

A motorized scooter was obtained to get around town, into stores, get to doctor's offices, and physical therapy and the lift for transporting the scooter. The scooter is large enough to accommodate Nedra, has footrests and Nedra has found she can sit in it for long hours when necessary. She is pleased as it provides her mobility at these places. Medicaid/Medicare and the Independent Living Center purchased the scooter and carlift.

-- Gordon Richins

D1 / PERSONAL CARE & MANAGEMENT for HOME/FAMILY

PAYERS: **Medical - primary payer**
Vocational- secondary payer
Consumer - secondary payer

Daily

- What is the morning routine - medications, health maintenance?
What technology is needed to perform these routines?

- What is the evening routine - medications, health maintenance?
What technology is needed to perform these routines?

- What are toileting, grooming, changing clothing needs to complete work? and how are they to be met? .

- What are the preferred routines for eating lunch or snacks?

- What are transportation needs from/to home?

- Is this individual responsible for care of others? How are these responsibilities to be met?

- How can user move independently or with chosen amount of assistance?

- How can the technology help the individual to become more independent and use less aid care?

- What is the access to any special areas necessary for performing self care?

- How will the technology assist in whatever home care is deemed necessary, particularly for the elderly?

Life Study: Teacher

D1 Self Care at Home

An 86 year old retired schoolteacher, though legally blind, was not ready to give up reading the Bible, letters from her friends or balancing her checkbook. She borrowed a CCTV from Project START and it opened the reading world for her again. She and her daughter purchased one for her.

-- D. Powers

Life Study: Alice

D1 Self Care at Home

Alice is a senior citizen with arthritis and a hearing impairment who attended an "Outreach to Seniors" event. A regional TRAID center had an exhibit there and Alice obtained information on ADLS, and viewed several devices on display and requested additional information on resources for her hearing impairment.

Alice called the TRAID center after receiving additional material sent to her. She asked for further assistance from TRAID staff who assisted her in identifying specific needs in the areas of writing, visual access and telephone access. Alice identified products in ADL catalogs that she was able to try out first at the Center and she felt they could help her. She decided to use her own funds to purchase them as they were relatively low cost. She received the devices and is regularly using the pen grip for letter writing, the soft scissors page magnifier and the reacher. She realized after viewing the volume control headsets at the TRAID Center that she had a phone that had this feature. She is now using it to good effect.

Outcome: Alice feels more independent since she is able to complete activities of daily living. She is able to communicate better with other using the volume control headset. Her quality of life has improved.

-- Lisa Rosano-Kaczkowski

Life Study: Chris

D1 Self Care at Home

Chris, 22 years old and has C4 quadriplegia. His functional goal was to be able to open and close doors, control lights, stereo, tv, and home security. The AT desired was an environmental control system, the Proxi-ECU. Department of Vocational Rehabilitation was the payer. Application was made requesting evaluation received from voc rehab: 3 hours authorized for initial phone interview and review of history. Phone call to counselor with estimated numbers of hours needed for multi-functional evaluation. Counselor sent authorization. Client was interviewed in home. Evaluation included home access and client life style. Chris was shown 3 videos of various ECU, and discussed pros and cons. Price, availability of vendor in our rural area, warranty, etc. was researched. Report was submitted to vocational rehabilitation with recommendation, price quotes and other bids of comparable product prices necessary to satisfy Rehab purchasing structure.

Outcome: Equipment recommended was approved. Counselor requested price quote for follow up and training for client.

-- Stephanie Schwartz, PT

E1 / PERSONAL CARE & MANAGEMENT for COMMUNITY

PAYERS: **Consumer - primary payer**
Medical - secondary payer
Vocational- secondary payer

Daily

- What is the morning routine - medications, health maintenance?
What technology is needed to perform these routines?

- What is the evening routine - medications, health maintenance?
What technology is needed to perform these routines?

- What are toileting, grooming, changing clothing needs to complete work? and how are they to be met?

- What are the preferred routines for eating lunch or snacks?

- What are transportation needs from/to home?

- Is this individual responsible for care of others? How are these responsibilities to be met?

- How can user move independently or with chosen amount of assistance?

- How can the technology help the individual to become more independent and use less aid care?

- What is the access to any special areas necessary for performing self care?

- How will the technology assist in whatever home care is deemed necessary, particularly for the elderly?

B2 / SITTING & MOBILITY for EDUCATION

PAYERS: **Medical - primary payer**
Education - secondary payer
Vocational - secondary payer

Technology itself

- How much does the percent of day the AT being used match the percent of the day it is recommended to be used? (goal: 100% compliance)

- How pleasant is the technology to look at and does not eclipse the user?

- How much can the technology can be customized to accommodate developmental changes, adaptable for growth and change? Is it feasible or cost effective?

- How involved are families? Are families and community behind the process of teaching?

Endurance

- How can the technology or other intervention increase comfort, decrease pain (medical well-being) so child can better attend to attend to education process, schoolwork, school activities?

- How can exposure to pressure areas be creased thereby saving skin integrity?

- How can the technology or other intervention enable user to sit throughout class, day (or whatever time period identified as goal)?

- Can time be decreased to complete a task?

Social Development and Interaction

- What is the individual's desire to interact with peers?

- What is the individual's ability to interact with peers?

- Are there ways to increase social opportunities?

- How can technology assist in social interactions?

Daily Access & Movement

- What is the morning routine - medications, health maintenance?

- What is the evening routine?

- What are toileting, grooming, changing clothing to complete work (e.g., lab coats)? and how to be met?

- What are the preferred routines for eating lunch or snacks at school? Parties at school?

- What are departure from school needs?

- How can user move independently or with chosen amount of assistance from class to class and more quickly (move, E,M,V)

- How can the technology make the individual more independent and use less aid care?

- What is the access to:
    - any special areas necessary for performing self care?

    - access to special areas and levels in rooms, e.g., band, orchestra, choir, music, art, stage, offices, e.g., principal's office

    - access to all school areas and equipment

    - access to playground equipment; move around playground

    - participate in sports

    - allows the user to transfer to and from the toilet

    - access to restrooms

    - access to maps and navigational signage

    - access rooms on different floors

    - access to tables, desks, floor sitting,...

    - access to computer specialty desks, lecture hall seats

    - move through cafeteria lines/areas, carry trays, books, and school supplies

    - access to blackboards

<u>Access to Related Transportation</u>

- What is the safe mode of transportation from home to car or school bus to school building to home again?

- What technology is needed for getting on and off the school bus (transportation)?

- How is equal movement during and access to field trips to be assured?

<u>Reduced Injury to Consumer</u>

- What technology is needed to reduce occurrence of improper cervical-spinal alignment during tasks?

- What technology is needed to reduce exposure to choking and respiratory problems?

- What technology can be incorporated to increase safety relevant to emergency situations, i.e., bombs, fire, tornado?

- What technology can be utilized to increase independence and consistency in environments for blind children?

Reduced Injury

- What technology is needed for prevention of injury to aides, care givers, and support personnel especially back injuries from moving technology user?

Increased Access to Future Opportunities

- How is the technology going to help increase ability to access work opportunities (community work programs), co-ops with employers?

- How will the technology
    - increase skill areas available in which training can occur?
    - improve access to increased opportunity and more exposure
    - increase potential for eventual vocational environment /goal
    - increase potential for independent living

Life Study: Heather

B2 (and C2, D2) Positioning and Mobility in Education

Three year old Heather has Tar's syndrome--she has no arms and her hands grow out of her shoulders. Her hands are functional. Her right leg is rigid, her right foot misshapen. Her left leg and foot are fully functional. There is no ambulation. The goal is to provide mobility that can be accessed independently and used in a pre-school classroom and on the playground.

A mobility system was designed for Heather using a motor and wheels from a salvaged, powered wheelchair. A new frame was designed and fabricated that permitted the custom seat to traverse from floor level to 18 inches above normal chair height. An acme-threaded screwdriver was used to raise and lower the seat. The joystick was mounted to enable Heather to control it with her left foot. She is able to access the seat by "hopping" into it at floor level. Activating a toggle switch with her hand then raises the seat. She learned to "drive" the chair in approximately 30 minutes and can use this system independently.

-- Leonard Anderson

A2 / SITTING & MOBILITY for WORK

PAYERS: **Medical - primary payer**
Vocational - secondary payer

Access to Employment

- How will the technology make employment possible?
- How will the technology increase opportunity to varied employment, choices, options?
- How will the technology allow individual to gain access to place of employment?
- What transportation needs have to be met to get to the job?

Daily Access & Movement

- How and what type of technology will reduce fatigue and increase time at task; increase time spent at job?
- Will the technology
    - decrease pain?
    - increase comfort?
    - increase speed of performance
    - maintain status of health and hygiene
- How and what type of technology will reduce exposure to repetitive motion injuries? minimize transfers between work positions? assist in carrying/transport, e.g., packages, trays?
- How and what type technology will assist in preventing secondary health conditions i.e., position shifting?
- What type of technology is needed in case of evacuation from workplace in case of fire, emergency, etc.?
- Will the technology decrease employer liability to injury?
- How will the technology improve access to choices for lunch, breaks, snacks, where they occur and nutritional needs met inside/outside building?
- How will the technology facilitate or improve movement in and around work area so can participate in all areas of workspace, safely and comfortably?
- What technology is needed to improve or increase movement between levels, floors, rooms, work areas, bathrooms?
- What technology is needed to afford access to office furniture and equipment-tables, desks, work stations, conference tables, photocopiers, etc.?

- Will this technology intervention reduce need for additional technology?

- Will this technology increase or enhance socialization? or increase interactions with colleagues?

- Will there be clean area to work in and is there quick access to break area, access to specific work environment e.g., truck cab, tractor cab, move inside restrooms

- Are there maps, navigation signage, alarms for work area.

- Is this technology aesthetically pleasing, e.g., an unobtrusive AT intervention (looks cool)?

- How will this technology reduce stigma of disability?

Life Study: Susie

A2 Positioning and Seating at Work

Susie, 26 years old female with CP (spastic quad) and severe dysarthria. Medicaid and Rehab Services Commission are primary payers for equipment. Functional goal for Susie was to increase sitting tolerance to do data entry work at a minimum of four hours per day demonstrating independent mobility to access all areas of her work site. A power wheelchair with contoured back and Roho cushion was desired. A comprehensive evaluation with Susie was performed including identification of functional strengths and limitations, environmental assessments of work home and recreation sites. Equipment and training needs were identified and appointments were made with local vendor. Medicaid letter of medical necessity complete and contacted the physician for Rx. Susie and OT met with the vendor to complete measurements and obtain price quote. Vendor submitted all information to Medicaid for prior authorization. Authorization received, chair ordered and Susie and OT completed final fitting upon arrival of the chair. Worked with the vendors technician to customize the seat to back angle, pad the footrests, and program the chair's electronics. OT worked with Susie on maintenance, safety, driving skills, trouble shooting, and charging. Susie was able to independently move herself to access all areas of her work site, home and community. She no longer has problems with skin breakdown. Positioning is symmetrical and function and comfortable. Fatigue was reduced. This allowed her to work a full day. Susie and OT pursued improved data entry on the computer to increase her work rate.

-- Vickie Smith, MA, OTR/L

Life Study: Gordon

A2 Positioning and Sitting at Work

Gordon needed a better sitting position in his power wheelchair. The AT desired was a cushion that would prevent decubitus ulcers. Gordon told the VR Counselor what he wanted and discussed options. VR paid for cushion and client ordered it. It was installed by home health aide.

-- Marty Blair

C2 / SITTING & MOBILITY for RECREATION

PAYERS: Consumer - primary payer

Attendance & Participation

- How will the technology assist in increasing ability of individual's participation in and attendance at school or community activities (spectator)?

- Will the technology:
  - increase the number of social opportunities?
  - enable interaction with peers?
  - increase opportunities for family interaction?
  - be part of new partnerships, groups?
  - advance individual's ability to compete?
  - "be cool", reduce stigma of disability?

Developmental

- How will technology provide normal developmental opportunities and what technology is needed?

- How will technology increase self-esteem and confidence, raise self-expectations?

Health

- What is the likelihood of greater health rewards from participation in recreation that technology facilitated access to or participation, e.g., increased serotonin levels, increased strength, endurance, circulation, digestive function, respiratory function and decrease in use of personal-care aides?

Access

- What technology is needed to assist getting to recreational activity, access to points of interests, playgrounds, parks, scenic spots, etc.?

- Will the individual be able to participate in activities of choice?

- Will the individual have freedom of movement in that activity?

Specific Access

- What are the technology needs for recreational specific mobility?

- What are the technology needs for recreation specific sensory aids for mobility?

- What technology is needed for starter and stopping signals?

- What technology is needed for safety and protection for both participant and their spectators? What technology is needed for the safety and protection of physical environment, e.g., windows, exits?

- What personnel is needed, teachers, teacher's aids?

Life Study: Karin

C2 Sitting and Mobility at Recreation

(also C1 - Self Care at Recreation, and C3 - Transportation at Recreation)

Karin, age 15 has myleomeningocele. Her goal is to have increased mobility at beach parties with peers on Long Island Sound. The desired AT is a recreational wheelchair addressing above without sacrificing posture transfers, and ability to attend to bladder needs. The AT procured was the Kuschall Terra Track wheelchair and a second Silhouette cushion cover in waterproof stretch vinyl to save cushion when swimming. Payer was self pay and insurance. Client's needs and desires were delineated in original evaluation but with attention to this specific area. Standard beach chairs and caster skis, wide metal rear wheels or 4 inch dune buggy style wheels were not considered given inability to self propel. Decided to look for Iron Hose and Terra Track chairs and these were obtained for trial. Client and O/P PT brought both chairs to Lake Michigan's Ohio Street Beach for evaluation. Client chose Terra Track for much decreased cut and maneuverability, and balance. She could self propel except on very soft sand and found wheelchair "cool". Parents sent check, chair was procured from Chicago vendor by family's request. Chair was adjusted for fit at 3rd visit and mailed home via Federal Express. Outcomes: Initial visit was positive. Follow up phone call after two months revealed use of chair but arrival of fall postponed significant usage as per parents' prediction. She thought it was great not to be pushed and all her friends wanted to try the cool chair.

-- Judith Russ Habasevich, PT

D2 / SITTING and MOBILITY for HOME/FAMILY

PAYER: Medical - primary payer
Vocational - secondary

Overall Quality of Life

- How will technology for mobility improve quality of life of individual?

- How will technology and what kind of technology is needed for participation in home management activities?

- What technology is needed to provide freedom to come and go as desired?

- What technology is needed to improve ability to leave home, shop, transport as desired?

- What technology is needed to access and increase leisure options?

- What technology is needed so individual can control one's home environment?

- What technology will enable or improve ability to access emergency systems i.e., phone, in case of a fire, emergency for tornado, earthquakes, floods?

Access

- What technology will assist in access to all desired places and spaces in home, including specialty locations - attics, roofs, decks, crawl spaces, yard, garden, garage, shed, storage closets, dumpsters, hallways, fire escapes, well/pump?

- What technology is needed to make home accessible so as to enable movement from room to room and change of level, i.e., ramps, stairs, elevators, transferring and moving between positions - table, toilet, sofa, counter, sink.

- How (and what) can technology assist with when moving materials or supplies?

- How and what technology is needed to access appliances in the home (large appliances - dishwasher, refrigerator, microwave)?

- What technology is needed for emergencies?

Health

- What technology will increase ability to self-care/ADL/PCAs?

- What technology will assist in, maintain or increase health and hygiene i.e., roll-in shower, being able to reach kitchen sink, dishwasher?

- What technology can reduce secondary health conditions, i.e., respiratory, circulation, skin integrity?
- What technology is needed for sex?

Family

- What technology can assist the individual's in contributing to family unit?
- What technology may be needed to increase ability to parent?
- What technology may assist in enhancing family relationships?
- What technology is needed to enabling direct care of child, i.e., change and feed baby?
- What technology is needed to effective discipline?
- What technology is needed to care of pets?
- What technology will increase ability to protect the care-giver(s)?
- How will technology impact cooperation of family?

Life Study: George

D2, E2 Positioning and Mobility in Home and Community

George is a 2 and 1/2 year old in the Early Intervention Program. He has cerebral palsy affecting primarily his lower extremities. His functional goal is to walk independently. A pediatric walker is the AT desired. During the development of the Individualized Family Service Plan (IFSP), his family voiced this goal and the physical therapists and others attending the meeting agreed and a referral was made to the TRAID Centers EI Lending Library and documented in the IFSP use of pediatric walker to meet child's goal. The physical therapist nd the family went to the Lending Library of the TRAID Center and received a one month loan of the pediatric walker for George. The loan can be extended if determined that the device is appropriate. If appropriate the EI program will purchase a walker for George's sole use.

Outcome: George is walking independently for the first time and is able to interact with others in the community. He is able to participate in many activities that one would expect a 2 1/2 year old to be involved. The EI program is purchasing a walker for George. EI officials are pleased that George had an opportunity to try out a device to ensure appropriateness.

-- Lisa Rosano-Kaczkowski

E2 / SITTING & MOBILITY for COMMUNITY

PAYER: Medical - primary payer
Education - secondary

Access

- How can technology increase opportunity to compete and interact, join groups? What technology is needed?

- How will technology increase choices for selection of items and services, choice of doctors, churches?

- How can technology access services in banks, town halls, libraries?

- How can technology assist or enable individual to access items on grocery shelves, drug-store shelves?

- What technology is needed to access church pew and kneeling, voting booths, check-out counters, ATMs?

- What technology is needed to and from transportation source, e.g., bus to civic/community location?

- How and what technology will improve ability to react to a community emergency such as evacuating a building in a fire, flood, etc.?

Personal Benefit

- How will technology increase self-esteem from participating in community?

- How and what technology is needed to assist individual in maintaining health/hygiene by being able to access public restrooms?

- How will technology provide opportunity for shopping to maintain nutritional status?

- How will technology increase endurance and exposure to community settings preparatory to vocational choice and placement?

Volunteer Involvement

- What technology will assist individual in getting active in civic activities by attending meetings? getting into positions in civic/community activities?

- What technology will assist individual or improve ability to perform volunteer work?

- How will technology assist individual in improving knowledge of community activities? enhance community relationships? broaden community knowledge base of disability?

A3 / TRANSPORTATION for WORK

PAYER: Vocational - primary payer

Travel to/from Work

- How will technology increase options of living outside urban areas? What technology is needed?

- How will technology increase options for after-work activities?

- How will technology increases opportunities for additional vocational training, e.g., night school?

- How will technology increase work and employment opportunities?

- How can technology assist or provide for arrival at work on time?

- What technology is needed so individual can arrive ready to work without fatigue?

- What effect will technology have on job security?

- Are there provisions for person to alter starting & quitting times (flexible scheduling)?

- What technology is needed to perform duties of work which involve travel on job?

- How will technology effect individual's earning income? Is there possible reduction of costs to other services?

- How will technology increase opportunities for advancement and compete?

- What technology is needed to increase work & employment opportunities in both number and variety?

- What technology is needed to equalize the playing field for job opportunity?

- What does the technology have to look like so as to be aesthetically pleasing, i.e. look cool?

WORK-RELATED Travel

- How can technology improve access to ticketing and payment process?

- What and how will technology effect individual's access to announcement, signage? (Information is available for people with vision, hearing loss & other impairments?)

- What is needed to assure year round availability? as well as safe, reliable, accessible, comfortable?

- Can technology assist in obtaining scheduling information? Identify.

• What technology is needed to making changing from one vehicle to another easy (transfer), i.e., plane or bus to taxi?

• Is there appropriate parking?

• Does individual need technology to improve or be able to control vehicle-steering, acceleration, braking, turning, radio, parking, lights, windows, indicators?

• How will technology make safe, appropriate, and functional positioning during travel?

• What is emergency egress from vehicle?

Travel at Work

• Can individual operate, lift, and store wheelchair independently or what technology is needed?

• What technology is needed to reduce risk of injury to care-giver in providing transportation options?

• How will technology enable individual to get on and off vehicle when needed (timing)?

• How will technology decrease or increase time allowance for task performance?

• Does the technology allow people to move among environments with dignity?

Life Study: Ronald

A3 Transportation and Work

Ronald needed reliable accessible transportation to and from work and to meetings by replacing a 1983 van lift. The AT desired and procured was the Freedom One conversion of newly purchased minivan (lowered floor, automatic lock down in front seat passenger position, remote door opener and ramp activation). Ronald was able to finance the purchase of the new minivan. This van style served several purposes -- easier for Ronald's wife and attendants to drive and park, better vision capabilities for Ronald to see outside and eliminated being on a high rising life. DVR agreed to pay for the conversion package which was in the $15,000 range as the transportation was necessary for Ronald's travel associated with his job.
-- Mary Secora

Life Study: Rick

A3 Transportation for Work

Rick, age 30, experienced spinal cord injury. Goal was to acquire modified van for transportation to work. Modifications needed were hand controls, life, lowered floor on van, etc. Modifications were procured through Vocational Rehabilitation. Rick required education in the equipment for driving the van, applications involved, self advocacy, and use of Vocational Rehabilitation services. Rick purchased the van and VR equipped the van after negotiations. Rick is now working full time.
-- Paul Rasinkski

B3 / TRANSPORTATION for EDUCATION

PAYER: Vocational- primary payer
Education - primary payers
Consumer - secondary payer

(Include all of the outcomes items under transportation for work plus the following:

Travel to/from Education

- How will technology increase options of education outside immediate areas? What technology is needed?

- How will technology increase options for after-school activities?

- How will technology increases opportunities for additional vocational training, e.g., night school?

- How will technology increase work and employment opportunities after school or part of school program?

- How can technology assist or provide for arrival at school on time?

- What technology is needed so individual can arrive ready for school without fatigue?

- Are there provisions for altering pick up and drop off times (how flexible is scheduling)?

- What technology is needed to participate in activities of school that involve travel?

- How will technology effect individual's education? Are there possible reduction of costs to other services?

- How will technology increase opportunities for advancement and competition?

- What technology is needed to increase educational opportunities in both number and variety?

- What does the technology have to look like so as to be aesthetically pleasing, i.e. look cool?

Transportation for School

- What and how will technology effect individual's access to announcement, signage? (Information is available for people with vision, hearing loss & other impairments?)

- What is needed to assure year round availability? as well as safe, reliable, accessible, comfortable?

• What technology is needed to make changing from one vehicle to another easy (transfer), i.e., plane or bus to taxi?

• Is there appropriate parking?

• How will technology make safe, appropriate, and functional positioning during travel?

• What is emergency egress from vehicle?

• Will the transportation provide access for loading and unloading mobility equipment, etc.?

Travel at Education Setting

• Can individual operate, lift, and store wheelchair independently or what technology is needed to assist with transfer or transportation?

• What technology is needed to reduce risk of injury to care-giver in providing transportation options?

• How will technology enable individual to get on and off vehicle when needed (timing)?

• How will technology decrease or increase time allowance for task performance?

• Does the technology allow people to move among environments with dignity?

Transportation Options

• Is there a need for flexible or additional transportation to equalize opportunity?

• Does this option increase choice - local or distant?

• Does this option include options for recreation?

• Can this transportation cover all terrain? What limits are there? environment, e.g., temperature

• How easily accessible is this transportation, ease of on & off vehicle?

• Does the transportation allow for self-care in vehicle, e.g., bathroom?

• Will the transportation provide access for loading and unloading mobility equipment, etc.?

D3 / TRANSPORTATION for HOME/FAMILY

PAYER: Consumer is primary payer.
Vocational and Education are secondary.

Ask questions previously put forward under **Transportation for Work and Education** and relate to Home goals and objectives.

E3 / TRANSPORTATION for COMMUNITY

PAYER: Consumer is usually primary payer
Medical- secondary payer

Ask questions previously put forward under Transportation for **Work and Education** and relate to consumer's goals and objectives for participation in or access to community.

Life Study: Ralph
E3 Transportation in Community

Ralph, age 54, suffered a spinal cord injury in 1964. Currently, Ralph's goal is facilitated transportation in the community. He has been served by vocational rehabilitation earlier years but, poor health and a series of operations made him ineligible for it. Once the TBI/Spinal Cord Fund was established as a funding source, he was enrolled in L.I.F.E. (Living Independence for Everyone).

Ralph was evaluated for van modification. His 1991 Dodge was easily equipped to accommodate his wheelchair. He is unable to drive himself but this modification enables his caretaker and family to transport him with little complication and undue physical strain.
-- Kathryn Rucker

A4 / COMMUNICATION for WORK

Payer: **Vocational - primary payer**
Consumer - secondary

Personal Benefit

- How will and what technology is needed to increase self-confidence?

- What technology will facilitate socialization? and still "be cool"?

- How and what technology will open opportunity to work?

- What technology is needed to become contributing member of workforce?

Opportunity to Work

- How will the technology increase clarity of communication? Can the individual be clearly understood by customers, colleagues, and supervisor?

- How will the technology increase access to number of people (assuming this is a goal), or work in cooperative team/work process?

- What technology is needed to communicate safety concerns?

- How will technology increase ability to interact in environment and from speed point of view? How does the technology affect the flow of interactions?

- How will this technology assist individual to instruct and direct co-workers and persons supervised, as well as increase ability to receive instruction? develop and make presentations as required by job?

- Will the technology assist individual's ability to raise issues, ask questions, make points at informal and formal meetings?

- How will this technology increase access to written communication, telephone, computer, e-mail, chat group?

- How will the technology increase flexibility via telecommunication, increase opportunities

- How will the technology increase ability to be promoted to a higher position, or increase opportunity to competitive employment?

Optimalizing Work Setting Options

- How will technology assist in telecommunicating if working from home?

- What technology, adaptations, or modifications are needed to access telecommunications using adaptive input and output communication devices to read and write?

B4 / COMMUNICATION for EDUCATION

PAYER: **Vocational - primary payer**
Education - primary payer
Consumer - secondary payer

Personal Benefit

- How will and what technology is needed to increase self-confidence?
- What technology will facilitate socialization? and still "be cool"?
- How and what technology will open opportunity to work?
- What technology is needed to become contributing member of class?

Opportunity to Schooling

- How will the technology increase clarity of communication? Can the individual be clearly understood by peers, teachers?
- How will the technology increase access to number of people (assuming this is a goal), or work in cooperative team process?
- What technology is needed to communicate safety concerns?
- How will technology increase ability to interact in environment and from speed point of view? How does the technology affect the flow of interactions?
- How will this technology increase access to written communication, telephone, computer, e-mail, chat group?

Optimalizing Setting Options

- How will technology assist in telecommunicating if schooling from home?
- What technology, adaptations, or modifications are needed to access telecommunications using adaptive input and output communication devices to read and write?
- How will technology provide for equal education opportunities to apply knowledge and ideas?

Knowledge Acquisition and Task Completion

- How will technology assist individual to ask questions, interact with peers, develop and make presentations, pose questions, make points known, challenge ideas, or raise concerns? AND to demonstrate knowledge and ideas - worksheets, reports, class presentations, oral exams, written exams, homework, group work?
- How will technology increase speed at which knowledge is gained? increase time on task?, or expedite completion of projects and assignments?

• How will the technology functionally increase reading and writing skills and computing abilities?

Communication in School Setting

• What and how will technology increase number and depth of communications with teachers, peers, parents, etc., both written and oral?

• How and what technology will assist individual's school participation in curriculum, school functions and after-school activities?

• What technology will improve individual's abilities to hold peer conversation, participate fully in class discussions, as well as receptive communication- blackboards, textbooks, lectures, slides/Audio Visual, WWW, computer files, spoken/oral conversations.

• What is anticipated affect on confidence, self-esteem, attitude and contribution?

• What long term affects are anticipated, i.e., to live independently?

Life Study: Sammy
B4 / C4 / D4 / E4 Communication in Education, Recreation, Home/Family and Community

Twenty year old, Sammy, has cerebral palsy and his goal is to be able to communicate verbally and in writing. The results of an evaluation indicated the need for an augmentative/alternative communication device. The Delta Talker was used to manage the dysarthria. After a three-month period, with the loan of the Delta Talker, Sammy's dysarthria improved significantly.

The plan of care signed by Sammy's physician and the information presented to the medical review team with EPSDT resulted in the acquisition of the Delta Talker plus Unity. The payor was Medicaid.

Today, Sammy is more independent, self-confident and able to integrate more easily in daily living activities with others.
-- Kathryn Rucker

Life Study: Michael
B4 Communication in Education and
B1 Self Care in Education

Michael is eighteen years old, blind and wants to attend college. He desires a computer system including a scanner and a printer. He borrowed an Arkenstone system through a loan program at Project START to be used at the university for classes. Following the successful use of the borrowed equipment, Vocational Rehabilitation for the Blind (VRB) purchased all equipment necessary for this young man to achieve his educational goals.
-- D. Powers

Life Study: Michael
B4 Communication in Education

Nine year old Michael has an undefined language impairment and wants to be able to communicate with teachers and classmates using an augmentative communication device. Medicaid is the payer. The AT desired and procured was the Dynavox. Application was made to Medicaid for the device and was rejected. Appeals were made by the Protection and Advocacy System and the application for Medicaid coverage was then approved. Student received Dynavox for use at home and at school. Training is occurring with school staff and peers. A training program is being designed for the parents. Student has been paired with another student in same building who also has a Dynavox.
-- Kathleen M. Fries

Life Study: Jack
B4 Communciation in Education

Jack is 12 years old and has severe dystonia. His goal is to improve his computer skills to enable him to better complete his schoolwork. Training on Dragon Dictate Systems is desired. His parents had obtained information on the Dragon Dictate System from the TRAID Center a year ago. They purchased a system for use at home and school, abut found training requirements to complex for them. As a result, the technology sat unused. The TRAID Center was contacted by the school system to ask about evaluations for assistive technology to improve Jacks's technology use in school. After discussion with the school and Jack's parents, it was decided that Jack did not need another evaluation, but needed to use the available technology effectively. The TRAID Center sent information about Dragon Dictate

trainers in the area, information about instructional software to match Jack's curriculum, information on general seating and positioning at work stations, and productivity software programs that could reduce keystrokes. It was decided that the school district would fund the training.

Outcome: Jack is currently receiving twice weekly training in Dragon Dictate in his home from a qualified trainer. Eh uses Dragon to independently complete homework and play games. Additional software was purchased to support his math program.

-- Lisa Rosano-Kaczkowski

Life Study: Candy

B4, B1 Communication and Self Care in Education

Candy is eighteen years old and has quadriplegia as a result of cerebral palsy. Her goal is to establish independence and efficiency in computer tasks. Candy was evaluated and it was determined that she needed a voice recognition system. A foundation in Mississippi responded positively after receiving letters of confirmation, pictures, quotes and demonstrated financial need. The foundation assisted the family with procuring Kolvox Office Talk version 3.0 with Kurzweil Voice for Windows, to help Candy continue her education in the most independent way.

-- Kathryn Rucker

D4 / COMMUNICATION for HOME/FAMILY

PAYER: Medical - primary payer
Education, Vocational, and Consumer are secondary payers.

Express Needs and Desires

- What technology is needed to express personal issues, preferences, choices, desires, requests, wants/needs (pain, bathroom, medical needs)?

- What technology is needed to express "don't wants"?
  challenge, discuss, voice opinion
  clarify, correct, repair
  pose questions
  initiate requests and conversations

Participate in Family

- How can technology enable individual to take part in family discussions?

- How can technology enable relationships to form and bond?

- What is needed to work more closely with family and providers?

- What is the desired frequency and duration of interacting? change over time?

- What is present involvement in family discussions? What is goal?

- What are goals to be able to talk to physician and health care community?

- What are goals to be able to talk and increase interactions with friends, socializing, etc.?

Access to Additional Means of Communication

- How will technology increase access to tv, radio, phone?

- Is the information retrievable, receivable, reception? to obtain information from tv, radio, CD, WWW, texts, magazines,newspaper, telephone

- What, if any, make-up or modified rules to games are needed?

Access Additional Technology

- Will technology increase number of ADLs, e.g., light/buzzer (sensory-cognitive)

- How will technology impact need for managed personal care assistance?

- Will technology increase life-death needs?

- How can the technology ensure access to emergency systems?

- What technology is needed to communicate for stroke or ALS persons?

Life Study: Chris

D4 Communication at Home

Chris, 22 years old and has C4 quadriplegia had communication goals for home which were to provide written communication and access to information on the Internet. Computer system with efficient access was the AT desired. VR was the payer and a computer system with Dragon and Head mouse was procured. VR requested evaluation and sent client history with authorization for 3 hours for review and estimation of total job. Estimated time and service providers needed and estimated costs were sent to VR who then authorized next step. Travel to Chris' house and set up simulation of desired computer system. Chris tried various mouse and switch access and discussed benefits of voice to text. Researched equipment prices, vendors, availability, warranty, etc. All information included in report to VR and estimate cost and additional bids from different equipment sources, training time needed and cost and vendor. Chris' system was delivered and set up. Training provided by local vendor. Follow up will continue to Chris and provider of training.

-- Stephanie Schwartz, PT

E4 / COMMUNICATION & COMMUNITY

Payer: **Consumer - primary payer**
Medical - secondary payer

Receptive

- Public large groups - indoor/outdoor

- Signage: streets, directional, regulatory- consumer ads, store hours, general information, historical stuff etc.

- Payment systems

Global/other

- What technology will facilitate participation in community activities-fun night classes, community center class, join church, cheer at baseball games?

- What technology is needed to vote?

- How can technology facilitate access to and use of library?

- What technology is needed to enable individual to volunteer?

- What technology is needed to call/take advantage of community resources, e.g., calling a cab?

B5 / SETTING SPECIFIC for EDUCATION

Payer: **Education - primary payer**
Vocational - primary payer
Consumer - primary or secondary

This cell provides an area for specific areas of interest to practitioner to identify questions specific to area. Several examples follow below for very specific aspects of technology for Education areas:

- use microscopes, classroom equipment, specific to subject areas, etc.
- use specific type desk
- participate in curricular specific activities - science, math, social studies, PE, language arts & spelling, music and art, lunch room, playground
- waiting in lines, moving in lines (lunch, lavatory, assembly)
- extra-curricular activities- sports, clubs, etc

Life Study: Sally

B5 Setting Specific for Education

Sally is 10 years old and has learning disabilities. She needed assistive technology to integrate reading and writing modalities; to provide as many cues, prompts, and aids to encourage fluent reading; to reduce frustration and emphasize enjoyment of reading; and to increase auditory comprehension of stories. The AT desired was some type of voice recognition software and optical character recognition software/hardware, text to speech software and word prediction software. TALN provided AT services in assessing Sally's ability to successfully use the above devices and provided knowledgeable information to allow an educated recommendation to be made to the school district which was the payer.

Following an Augmentative Communication Consultation in May from Mr. B (MB), the mother of Sally submitted a request to the school asking tom to acquire a windows based computer for the All-for-One classroom and if possible, a laptop for Sally to use both at school and at home. TALN was contacted TALN to provide an AT assessment to help determine the appropriate AT software necessary for these computers which would increase Sally's opportunity to receive an equal education.

TALN staff visited with Sally, Sally's mother, and Sally's teachers, to determine what AT would enhance Sally's educational opportunity. Upon MB's recommendation, Sally's mother downloaded a copy of VoiceType and was amazed at how well the demo recognized Sally's voice. TALN provided Sally with an opportunity to try a full version of Dragon Dictate and discovered that while the system could "recognize" her voice pattern, in Sally's case its full application was probably a year to two down the line. She need to both compose more fully and read at a higher level for the full value to be seen. Then clearly, access to such software would have the advantages of reinforcing letter/sound relationships, reinforcing reading, and assisting her in communicating more fully than she could were she simply attempting to write a message on paper - or even type the message. Next Sally explored the features of CO:Writer, a word prediction program that provided her with a shortcut in creating text. Once Sally used the program, it became obvious that it was also too advanced for her. In order to be successful, she would have to be better able to independently produce text, know the first letter of quite a few words and be able to read the words in the choice list.

Sally was delighted when she tried Write:Outloud and heard the computer read her story back to her. WriteOutloud provided the widest range of immediate applications for Sally. Both mother and teacher could envision Sally using this program to learn her spelling words (sight words) by typing them and then listening to them. And finally, Sally tried Kurzweil's ReadingEdge. The Reading Edge provided Sally with the opportunity to scan in text, such as a book, and hear it read aloud. Again, the benefit could instantly be envisioned and it was asked to borrow the ReadingEdge for a month to allow Sally an opportunity to test drive it more independently in the comfort of her home.

Outcome: This AT assessment was scheduled to expose Sally to a variety of software/hardware devices that would encourage fluent reading while reducing frustration. This was accomplished by Sally using the ReadingEdge successfully and independently at home. This assessment was also scheduled in order to discover what AT software would integrate writing modalities which were accomplished through the use of Write:Outloud. While each of the devices were successful, an all-in-one unit would be more appropriate and easier for Sally to use. Therefore, it has been recommended that Sally use the Arkenstone OpenBook system with JAWs. Had Sally not had the opportunity to test drive the AT, the school might have purchased inappropriate software/hardware, thus adding to Sally's frustration in learning to read and to write. -- Laurie Brooks